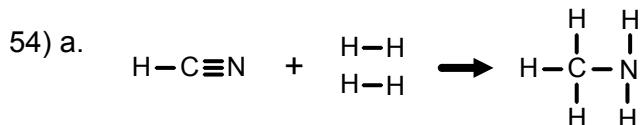
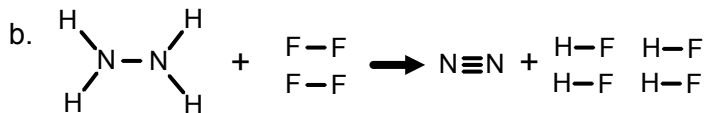


### Assignment 8.3

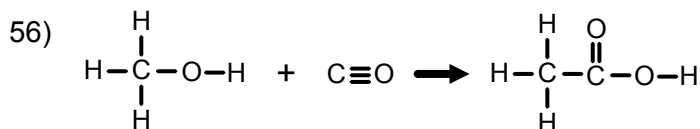
#54, 56, 57, 64, 66



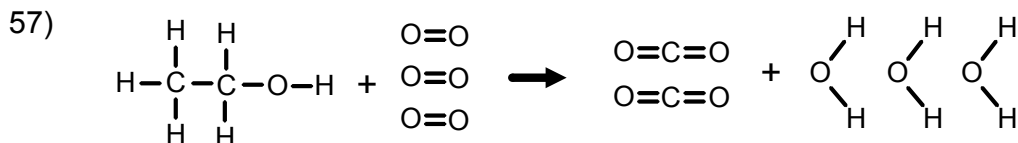
$$\Delta H = 413 + 891 + 2(432) - [3(413) + 305 + 2(391)] = -158 \text{ kJ}$$



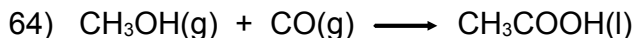
$$\Delta H = 4(391) + 160 + 2(154) - [941 + 4(565)] = -1169 \text{ kJ}$$



$$\Delta H = 3(413) + 358 + 467 + 1072 - [3(413) + 347 + 745 + 358 + 467] = -20 \text{ kJ}$$

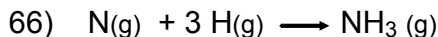


$$\Delta H = 5(413) + 347 + 358 + 467 + 3(495) - [4(799) + 6(467)] = -1276 \text{ kJ}$$



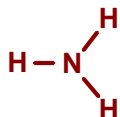
$$\Delta H = H_f(\text{prod}) - H_f(\text{react}) = (-484) - (-201) - (-110.5) = -173 \text{ kJ}$$

Using bond energies we got -20 kJ. The difference is because the values on table 8.4 are only for gases. Since the acetic acid produced is a liquid, the extra 153 kJ of energy was released when it condensed.



$$\Delta H = -46.1 - (472.7) - 3(216.0) = -1167 \text{ kJ/mol}$$

(energy is always released when forming bonds)



$3(391) = 1173 \text{ kJ}$  (this is the energy needed to break those bonds)